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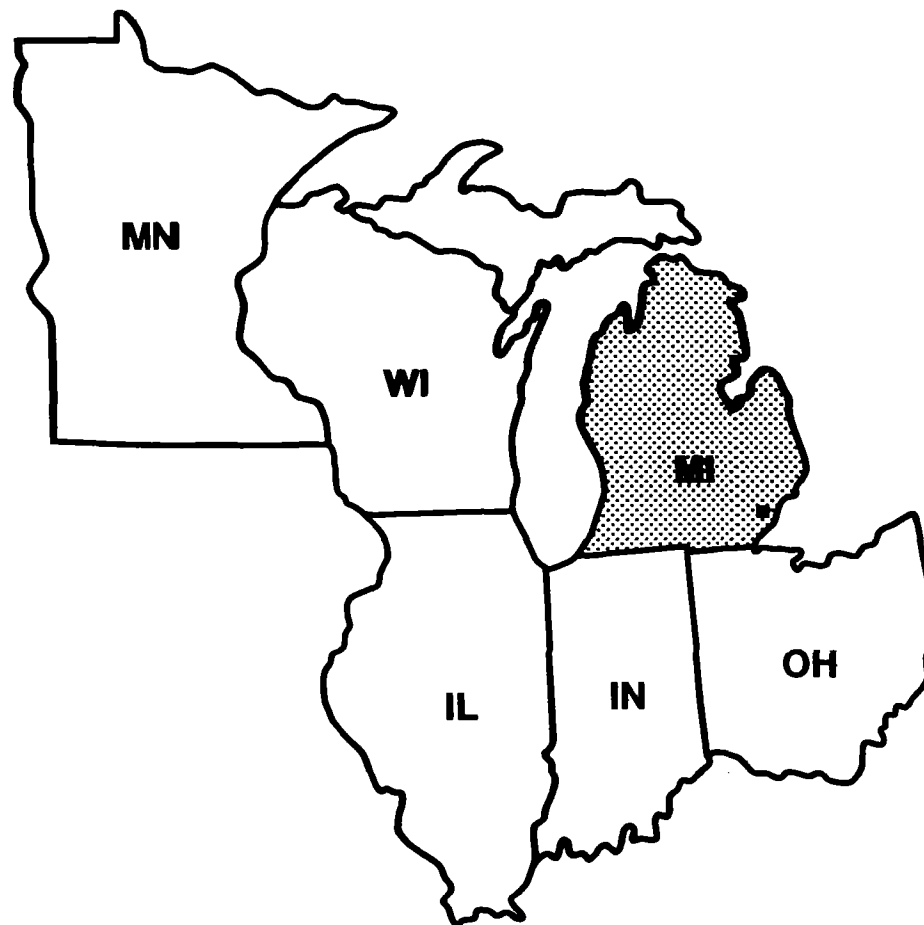
TS-PIC-20305593S
JUNE 2003

Research and Development



AERIAL PHOTOGRAPHIC ANALYSIS OF N-FORCER SITE DEARBORN, MICHIGAN

EPA Region 5



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JUNE 2003

AERIAL PHOTOGRAPHIC ANALYSIS OF
N-FORCER SITE

Dearborn, Michigan

by

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Contract No. 68-D-00-267

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NOTICE

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ABSTRACT

A historical aerial photographic analysis of the N-Forcer site located in Dearborn, Wayne County, Michigan, was conducted to provide operational remote sensing support to field investigations of the U.S. Environmental Protection Agency (EPA) Region 5 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The analysis was conducted to document landscape morphology, patterns of waste disposal, and other observable activities and conditions of environmental significance at this Superfund pre-remedial site. Evidence of the storage of waste material in the form of stoner rock in outdoor storage areas with unrestricted public access was of particular concern. In addition to the standard historical aerial photographic analysis, an Anderson Level II Land Use/Land Cover analysis was performed for the area within a 0.8-kilometer (0.5-mile) radius of the site for the 1951 and 2000 photographs.

The N-Forcer site is approximately 1.25 hectares (3.09 acres) in area. According to collateral information, the W.R. Grace Company operated an asbestos exfoliation plant at this location from the 1950's to 1990 (EPA, 2002).

Fourteen dates of aerial photographs, covering the period from 1951 through 2000, were acquired and analyzed for this report. Film from 1951, 1957, 1966, 1973, 1978, 1980, 1985, 1990, and 2000 was reproduced for inclusion in this report. Significant on-site features identified in the photographic analysis include the production facility, light-toned material, disturbed ground, staining, open storage areas, vertical tanks, a probable horizontal tank, trailers, and railcars.

The EPA Environmental Sciences Division, Landscape Ecology Branch in Las Vegas, Nevada, prepared this report for the EPA Region 5 Superfund office in Chicago, Illinois, and the EPA Office of Emergency and Remedial Response in Washington, D.C.

CONTENTS

	<u>Page</u>
Abstract	iii
Introduction	1
Methodology.....	5
Photographic Analysis.....	10
April 20, 1951	14
May 16, 1957	16
November 21, 1966	18
October 15, 1973	20
July 17, 1978	22
June 11, 1980	24
May 8, 1985	26
April 18, 1990	28
Glossary	30
References	33
Fold-out Legend.....	35

FIGURES

<u>Number</u>		
1	Study Area Location Map, Wayne County, Michigan, 1972	2
2	Local Study Area Location Map, Dearborn, Michigan, 1983	3
3	N-Forcer Site, Land Use Analysis, April 20, 1951	N/A
4	N-Forcer Site, Land Use Analysis, March 26, 2000	N/A
4A	N-Forcer Site, Land Use Analysis, March 26, 2000	N/A
5	N-Forcer Site, April 20, 1951	N/A
6	N-Forcer Site, May 16, 1957	N/A
7	N-Forcer Site, November 21, 1966	N/A
8	N-Forcer Site, October 15, 1973	N/A
9	N-Forcer Site, July 17, 1978	N/A
10	N-Forcer Site, June 11, 1980	N/A
11	N-Forcer Site, May 8, 1985	N/A
12	N-Forcer Site, April 18, 1990	N/A

INTRODUCTION

This report presents the results of a historical aerial photographic analysis of the N-Forcer site located in Dearborn, Wayne County, Michigan (SSID #B55P). It provides operational remote sensing support to field investigations of the U.S. Environmental Protection Agency (EPA) Region 5 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The analysis has been prepared to document landscape morphology, patterns of waste disposal, and other observable activities and conditions of environmental significance at this Superfund pre-remedial site. Evidence of the storage of waste material in the form of stoner rock in outdoor storage areas with unrestricted public access was of particular concern.

Figure 1 illustrates the approximate location of the N-Forcer site within the State of Michigan (USGS, 1972), and Figure 2 depicts the local study area of the site on an overlay to a color-copy of a U.S. Geological Survey topographic map (USGS, 1983).

During the time period covered in this report, the N-Forcer site was bounded on the north and west by industrial facilities, on the east by rail lines, and on the south by Henn Street. The site encompasses an area of approximately 1.25 hectares (3.09 acres).

According to collateral information, the W.R. Grace Company operated an asbestos exfoliation plant at this location from the 1950's to 1990. Vermiculite ore was transported to the site by rail car, and asbestos was then extracted from the ore. Stoner rock was generated as a waste byproduct of the extraction process. Both the finished product and the waste material were shipped from the facility via truck. Documented complaints indicate that at times a fine dust coated area cars when the plant was in operation. The U.S. EPA is investigating the site for asbestos contamination in the form of tremolite (EPA, 2002).

Fourteen dates of aerial photographs, covering the period from 1951 through 2000 were acquired and analyzed for this report. Film from 1951, 1957, 1966, 1973, 1978, 1980, 1985, 1990, and 2000 was reproduced for inclusion in this report. For the 1951 photographs, in addition to the

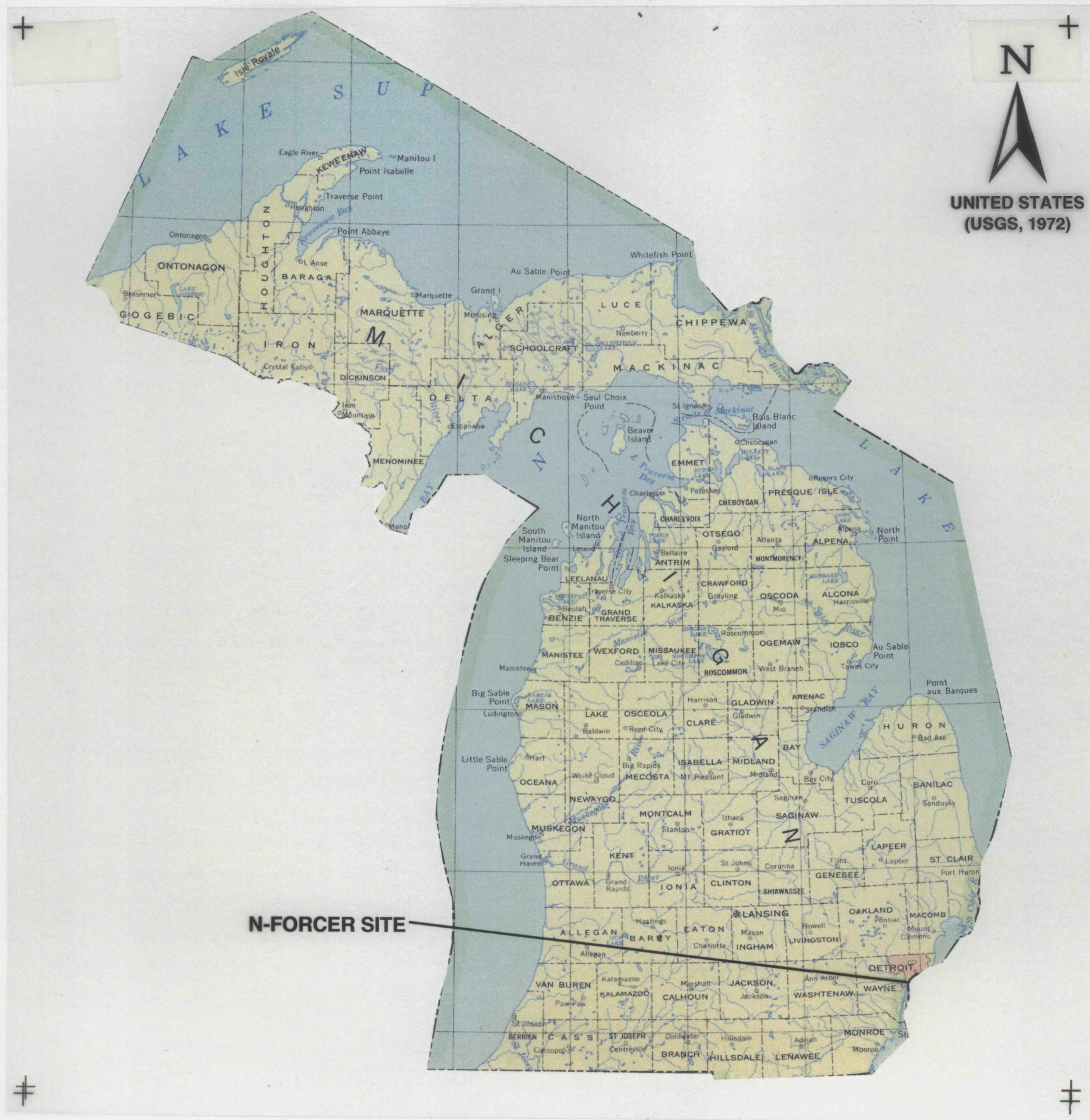


FIGURE 1
N-FORCER SITE

STUDY AREA LOCATION MAP
WAYNE COUNTY, MICHIGAN

APPROX. SCALE 1:2,500,000

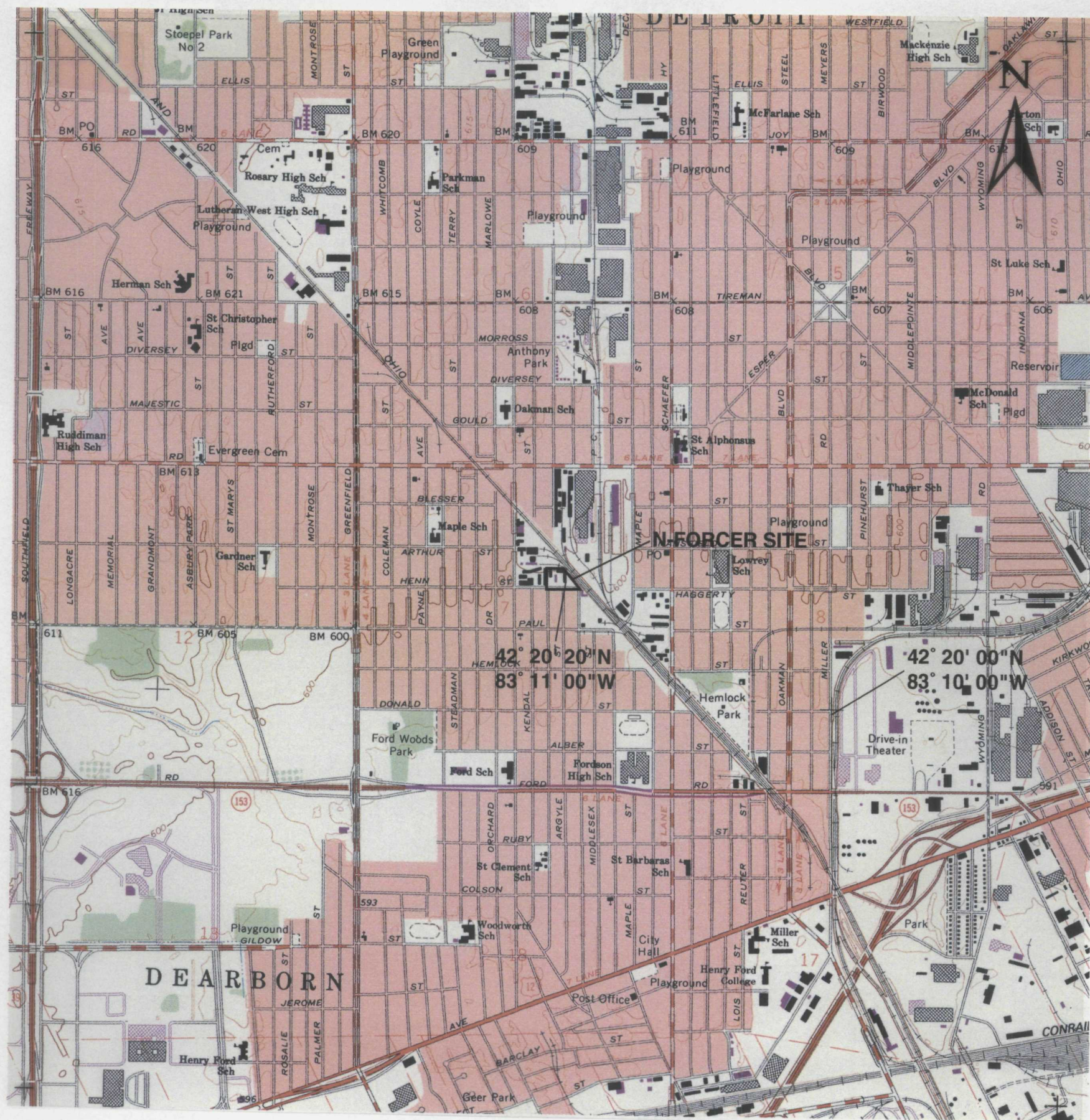


FIGURE 2
N-FORCER SITE

LOCAL STUDY AREA LOCATION MAP
DEARBORN, MICHIGAN
USGS QUADRANGLE, 1983

APPROX. SCALE 1:24,000

standard historical aerial photographic analysis, an Anderson Level II Land Use/Cover analysis was performed for the area within a 0.8-kilometer (0.5-mile) radius of the site. For the 2000 photographs, only the Anderson Level II Land Use/Land Cover analysis was performed. Significant on-site features identified in the photographic analysis include the production facility, light-toned material, disturbed ground, staining, open storage areas, vertical tanks, a probable horizontal tank, trailers, and railcars.

A Glossary, defining features or conditions identified in this report, follows the Photographic Analysis section. Sources for all maps, aerial photographs, and collateral data used in this report are listed in the References section. A list of all aerial photographs that were identified and evaluated for potential application to this study can be obtained by contacting the EPA Work Assignment Manager.

The EPA Environmental Sciences Division, Landscape Ecology Branch in Las Vegas, Nevada, prepared this report for the EPA Region 5 Superfund office in Chicago, Illinois, and the EPA Office of Emergency and Remedial Response in Washington, D.C.

METHODOLOGY

This report was prepared using a standard methodology that includes the following steps:

- data identification and acquisition
- photographic analysis and interpretation
- graphics and text preparation

These steps are described in this section. Subsections also address details related to specific kinds of analyses that may be required to identify environmental features such as surface drainage and wetlands. All operational steps and processes used to perform this work (including data identification and acquisition, photographic analysis and interpretation, and graphics and text preparation) adhere to strict QA/QC guidelines and standard operating procedures (SOPs). These guidelines and procedures are documented in the Master Quality Assurance Project Plan (QAPP) for the Remote Sensing Support Services Contract, 68-D-00-267 (LMS, 2002).

Data identification and acquisition included a search of government and commercial sources of historical aerial photographs to identify and obtain photographs with optimal spatial and temporal resolution and image quality for the study area. In addition, U.S. Geological Survey (USGS) topographic maps were obtained to show the study area location and to provide geographic and topographic context.

To conduct this analysis, the photographic analyst obtained diapositives (transparencies) of historical aerial photographs showing the study area. Diapositives are most often used for analysis instead of prints because the diapositives have superior photographic resolution. Diapositives show minute details of significant environmental features that may not be discernible on paper prints.

A photographic analyst uses a stereoscope to view adjacent, overlapping pairs of diapositives on a backlit light table. In most cases, the stereoscope is capable of various magnifications up to 60 power. Stereoscopic viewing involves using the principle of parallax (observing a feature from

slightly different positions) to observe a three-dimensional representation of the area of interest. The stereoscope enhances the photo interpretation process by allowing the analyst to observe vertical as well as horizontal spatial relationships of natural and cultural features.

The process of photographic analysis involves the visual examination and comparison of many components of the photographic image. These components include shadow, tone, color, texture, shape, size, pattern, and landscape context of individual elements of a photograph. The photographic analyst identifies objects, features, and "signatures" associated with specific environmental conditions or events. The term "signature" refers to a combination of components or characteristics that indicate a specific object, condition, or pattern of environmental significance. The academic and professional training, photo interpretation experience gained through repetitive observations of similar features or activities, and deductive logic of the analyst as well as background information from collateral sources (e.g., site maps, geologic reports, and soil surveys) are critical factors employed in the photographic analysis.

The photographic analyst records the results of the analysis by using a standard set of annotations and terminology to identify objects and features observed in the diapositives. Significant findings are annotated on overlays attached to the photographs in the report and are discussed in the accompanying text. Annotations that are self-explanatory may not be discussed in the text. The annotations are defined in the Fold-out Legend at the end of the report and in the text when first used.

Objects and features are identified in the graphics and text according to the photographic analyst's degree of confidence in the evidence. A distinction is made between certain, probable, and possible identifications. When the photographic analyst believes the identification is unmistakable, no qualifier is used. Probable is used when a limited number of discernible characteristics allow the photographic analyst to be reasonably certain of a feature's identification. Possible is used when only a few characteristics are discernible and the photographic analyst can only infer a feature's identification.

The prints presented in this report have been reproduced, either by photographic or computer methods, from the original film. Reproductions are made from the original film and may be either contact (the same size) prints or enlargements, depending on the scale of the original film. Any computer-produced prints used in this report are generated from scans of the film at approximately 1,300 dots per inch (dpi) and are printed at 600 dpi. Although the reproductions allow effective display of the interpretive annotations, they may have less photographic resolution than the original film. Therefore, some of the objects and features identified in the original image and described in the text may not be clearly discernible on the prints in this report.

Study area boundaries shown in this report were determined from aerial photographs or collateral data and do not denote legal property lines or ownership.

Color Infrared Photography

Color infrared film has been reproduced for the 1978 photograph (Figure 9). Normal color film records reflected energy in the blue, green, and red portions of the electromagnetic spectrum. Color infrared film differs in that it is sensitive not only to reflected blue, green, and red energy, but also to reflected energy in the infrared portions of the electromagnetic spectrum; however, the blue energy is filtered out and only the green, red, and infrared energy is recorded.

When color infrared film is processed, it displays "false" colors that do not correspond with the true colors of the features photographed. For example, features that are highly reflective in the infrared portion of the spectrum, such as healthy green vegetation, appear red to magenta on color infrared film. The false color displayed by a feature is produced in accordance with the proportions of infrared, green, and red energy it reflects. These proportions are referred to as the feature's "spectral reflectance characteristics". To accurately interpret the true color of a particular feature from color infrared film, knowledge of the spectral reflectance characteristics of that feature is required. This information is not readily available for the majority of features identified in this report. Therefore, unless otherwise indicated, no attempt is made to interpret the

true colors of the features identified on the color infrared film analyzed for this report.

Surface Drainage

The surface drainage analysis produced for this report identifies the direction and potential path that a liquid spill or surface runoff would follow based on the topography of the terrain and the presence of discernible obstacles to surface flow. The analyst determines the direction of surface drainage by stereoscopic analysis of the aerial photographs and by examining USGS topographic maps. Site-specific surface drainage patterns are annotated on the map or photo overlay. Where the direction of subtle drainage cannot be determined, an indeterminate drainage line symbol is used. Regional surface flow is ascertained from the USGS topographic maps.

PHOTOGRAPHIC ANALYSIS

The N-Forcer site is situated approximately 183 meters (600 feet) above sea level on flat topography. No distinct drainage pathways from the site were observed.

Environmentally significant features are annotated on the print enlargements throughout this report. In cases when features are not annotated in the subsequent date of analysis, they are either no longer visible or are deemed to be inactive. Buildings are annotated when present, however are only discussed in the text when first noted or when associated with an environmentally significant feature.

APRIL 20, 1951 LAND USE ANALYSIS (FIGURE 3)

The Anderson Level II land use classification system (USGS, 1976) is used in this report to identify categories of land use. Two additional categories, Open Land and Fill Area, were also used to help address the issues presented in the work request.

The area within a 0.8-kilometer (0.5-mile) radius of the site is primarily in Residential land use. Other land use classifications noted, listed in approximate descending order of ground surface covered, include the following: Industrial, Open Land, Commercial and Services, Utilities, Mixed Urban or Built-Up Land, and Other Urban or Built-Up Land.

The parcels of Open Land annotated on this figure occur primarily as undeveloped lots in or adjacent to Residential areas. Two fill areas are noted, one to the southeast of the N-Forcer site and one adjacent to the railroad tracks northeast of the site.



FIGURE 3
N-FORCER SITE

LAND USE ANALYSIS
APRIL 20, 1951

APPROX. SCALE 1:8,290

MARCH 26, 2000 LAND USE ANALYSIS (FIGURE 4)

As on the 1951 photograph (FIGURE 3), the area within a 0.8-kilometer (0.5-mile) radius of the site is primarily in Residential land use. Other land use classifications noted, listed in approximate descending order of ground surface covered, include the following: Industrial, Commercial and Services, Utilities, Open Land, and Other Urban or Built-Up Land.

Changes in land use between 1951 and 2000 include an increase in the industrial and Commercial and Services classifications and a decrease in the Open Land classification. The larger of the remaining parcels of Open Land are in use as athletic fields (not annotated). The smaller parcels are undeveloped lots in Residential areas.

The Fill Area noted adjacent to the railroad tracks northeast of the N-Forcer site on the 1951 photograph (FIGURE 3) is now classified as Industrial. The fill area noted to the southeast of the N-Forcer site on the 1951 photograph (FIGURE 3) is now classified as Commercial and Services and Residential.

MARCH 26, 2000 LAND USE ANALYSIS (FIGURE 4A)

This figure identifies parcels of Open Land that have remained open since 1951 (FIGURE 3).



FIGURE 4
FIGURE 4A
N-FORCER SITE

LAND USE ANALYSIS
MARCH 26, 2000

APPROX. SCALE 1:8,290

APRIL 20, 1951 (FIGURE 5)

The N-Forcer site is bounded by industrial facilities (not annotated) to the north and west, by railroad tracks to the east, and by Henn Street to the south, which provides vehicular access to the site. Open lots (not annotated) are present in a residential area to the south of Henn Street.

The site contains two adjoining buildings (B) in the north-central portion of the site that appear to be the production facility and will be identified as such for the remainder of this report. A third building is located in the northwestern portion of the site. Two rail spurs leading from the railroad to the east service the production facility.

Probable light-toned particulate material (not annotated) is noted on portions of the roof of the production facility. Probable (PROB) light-toned (LT) material (M) is seen adjacent to the southwestern portion of the production facility and to the east of the production facility, adjacent to the rail spur. This latter light-toned material may have resulted from loading and/or unloading activities between railcars and the production facility. Probable light-toned mounded material (MM) is noted to the northwest of the production facility. A probable conveyor (CON) leads from the northern side of the production facility towards the rail spur to the north. Six trailers (TRL) are visible on an unpaved parking lot (not annotated) south of the production facility.

To the west of the production facility, an area of disturbed ground (DG) that extends to the southern portion of the site is noted. A drainage pathway extends from the northwestern corner of the production facility into the southern portion of the site.

Four railcars (RC) are present on the rail spurs.

A fill area located outside the area covered by the print extends southward from the southeastern corner of the site. The fill area contains a thin layer of graded light-toned material. Access to this fill area is via the N-Forcer site and via Henn Street.



FIGURE 5
N-FORCER SITE

APRIL 20, 1951

APPROX. SCALE 1:990

MAY 16, 1957 (FIGURE 6)

Two building additions (BA) have been constructed on the production facility, one on the northern side and one on the southeastern side of the buildings. The building addition to the north was first noted on the 1953 photographs (not reproduced for this report) and is located at the site of the probable conveyor noted on the 1951 photographs (FIGURE 5). This probable conveyor was last seen on the 1952 photographs (not reproduced for this report). Two new rail spurs, which do not appear on subsequent photographs, are visible leading to this building addition from the east.

Probable light-toned particulate material was noted on portions of the roof of the production facility on the 1952 and 1953 photographs (neither date reproduced for this report), though not on the 1957 photographs. Light-toned mounded material is visible near the northwestern end of the production facility. A pad is seen where probable light-toned material was noted adjacent to the southwestern portion of the production facility on the 1951 photographs (FIGURE 5). Light-toned mounded material is visible southwest of this pad. Light-toned material is noted adjacent to the rail spur to the east of the production facility where it was also seen in 1951 (FIGURE 5), and probable light-toned mounded material is noted further to the southeast.

The disturbed ground noted west and southwest of the production facility on the 1951 photograph is no longer observed.

Three trailers and possible (POSS) staining (ST) are seen to the south of the production facility. A trailer is also present in the southwestern portion of the site.

Light-toned material was last noted in the fill area southeast of the N-Forcer site on the 1952 photographs (not reproduced for this report). The fill area had become vegetated on the 1953 photographs (not reproduced for this report) and will not be discussed further in this report.

NOVEMBER 21, 1966 (FIGURE 7)

Light-toned mounded material is seen adjacent to the southwestern side of the production facility, where light-toned material was previously noted on the 1951 photograph (FIGURE 5). Further to the southwest, a smaller area of light-toned mounded material present on the 1956 photograph (FIGURE 6) is once again noted. Light-toned material is noted adjacent to the rail spur to the east of the production facility where it has been seen on all photographs since 1951 (FIGURE 5), and possible light-toned material is noted further to the south. Multi-toned (MLT) mounded material is visible to the northwest of the production facility.

Three trailers and three areas of possible staining are seen on the parking lot (not annotated) south of the production facility. Four trailers are present east of the production facility.

Four railcars are visible on the rail spurs.



FIGURE 7
N-FORCER SITE

NOVEMBER 21, 1966

APPROX. SCALE 1:1,040

OCTOBER 15, 1973 (FIGURE 8)

A new building (NB), first noted on the 1972 photographs (not reproduced for this report), is present in the west-central portion of the site. An open storage area (OS) containing probable crates (CR) is seen to the east of this new building. Open storage areas containing unidentified objects (not annotated) are noted adjacent to the western side of the production facility and adjacent to the northern side of the building in the western portion of the site. A dumpster (DU) is visible adjacent to this latter open storage area.

Probable light-toned particulate material (not annotated) is noted on portions of the roof of the production facility. Light-toned material is visible adjacent to the rail spur to the east of the production facility where it has been seen on all photographs since 1951 (FIGURE 5). Two rectangular containers (C) holding multi-toned objects (O) or material are visible in the central portion of the site.

To the south of the production facility, a group of five trailers and two individual trailers are observed.

Six railcars are visible on the rail spurs.



FIGURE 8
N-FORCER SITE

OCTOBER 15, 1973

APPROX. SCALE 1:1,010

JULY 17, 1978 (FIGURE 9)

Light-toned mounded material and four vertical tanks (VT) are visible northwest of the production facility. These vertical tanks are present on all subsequent photographs in this report and will continue to be annotated, though not further discussed unless associated with an environmentally significant feature. A portion of the roof of the production facility building south of the vertical tanks has been removed (not annotated).

To the east of the production facility, two dumpsters, three cylindrical (CYL) objects, and five trailers are seen. The light-toned material that was visible adjacent to the rail spur east of the production facility from 1951 through 1973 (FIGURES 5 through 8) is no longer present. On the parking lot (not annotated) south of the production facility, eight trailers and an open storage area containing probable crates are noted.

In the northwestern portion of the site, probable staining is visible in a probable open storage area adjacent to the northern edge of the building. A possible open storage area is seen adjacent to the western side of this building.

The rail spur in the southeastern portion of the site appears to have fallen into disuse. Two railcars are present on the northern rail spur.



FIGURE 9
N-FORCER SITE

JULY 17, 1978

APPROX. SCALE 1:1,110

JUNE 11, 1980 (FIGURE 10)

A building addition has been constructed on the production facility where a portion of the roof was noted as having been removed on the 1978 photograph (FIGURE 9). A probable stain is seen between the northern side of the production facility and the rail spur. A probable open storage area containing unidentified objects (not annotated) is visible adjacent to the eastern side of the production facility. Three trailers, probable light-toned material, and an open storage area containing possible crates are noted in the parking lot (not annotated) to the south of the production facility.

A total of six trailers are observed to the southeast of the production facility and three trailers are seen in the southern portion of the site.

The building in the northwestern portion of the site has had a building addition constructed on its western side, where a possible open storage area was noted on the 1978 photograph (FIGURE 9). A small open storage area containing unidentified objects is visible to the north of this building addition. Further to the east, an open storage area containing a probable horizontal tank (HT) and unidentified objects (not annotated) is noted. Staining is visible in the vicinity of this probable horizontal tank and probable staining is observed to the south.

The rail spur noted in the southeastern portion of the site since 1951 (FIGURE 5) is no longer present. One railcar is visible on the remaining rail spur.



FIGURE 10
N-FORCER SITE

JUNE 11, 1980

APPROX. SCALE 1:990

MAY 8, 1985 (FIGURE 11)

An open storage area containing unidentified objects (not annotated) is seen adjacent to the eastern side of the production facility. Two dumpsters and probable light-toned material are visible further to the east and southeast. Five trailers and an open storage area are noted in the parking lot (not annotated) to the south of the production facility. One trailer is visible in the southern portion of the site and a total of five trailers are seen in the southeastern portion of the site.

In the northwestern portion of the site, possible staining and a dumpster are observed adjacent to the northeastern corner of the building.

Two railcars are seen on the rail spur.



FIGURE 11
N-FORCER SITE

MAY 8, 1985

APPROX. SCALE 1:1,090

APRIL 18, 1990 (FIGURE 12)

A building addition links the western end of the production facility to the building in the south-central portion of the site. The light-toned area visible on the roof of the production facility on this photograph appears to be the natural tone of the roofing material and not related to the light-toned materials previously noted on site or to fugitive dust. An open storage area containing unidentified objects (not annotated) is visible adjacent to the eastern side of the production facility. Two dumpsters are noted further to the east. A group of five trailers is seen adjacent to the southern side of the production facility. Two groups of six trailers each are present; one is located in the southern portion of the site and one in the southeastern portion of the site.

An open storage area with probable containers is visible to the north of the building addition. Further to the west, probable staining was noted on the 1988 photographs (not reproduced for this report), in an area where possible staining was noted in 1985 (FIGURE 11) however, no staining was visible in 1990.

Two railcars are visible on the rail spur.



FIGURE 12
N-FORCER SITE

APRIL 18, 1990

APPROX. SCALE 1:1,000

GLOSSARY

Building (B) - A relatively permanent, essentially boxlike construction having a roof. (NB) A building added since last photo coverage. (RB) A building removed since last photo coverage.

Container(s) (C) - Any portable device in which material is stored, transported, handled, or disposed.

Conveyor (CON) - An endless chain or belt, set of rollers, etc., for carrying materials.

Crate(s) (CR) - A box used for packing and transporting various items.

Cylindrical (CYL) - Having the form of a cylinder.

Dark-, Medium-, Multi-, Light-Toned (DK, MT, MLT, LT) - Tones of features in question are compared with the darkest and lightest tones of gray (if using B&W photographs) on the print.

Disturbed Ground (DG) - A rough area where the ground surface has been dug up or overturned.

Dumpster (DU) - A bin, frequently of metal, into which materials are discarded.

Feature Boundary - Used to delineate the extent of a feature or area (e.g., tank farm, trench, large stain, open storage area).

Material (M) - Raw or waste materials on or in the vicinity of the site.

Mounded Material (MM) - Piles of raw or waste materials on or in the vicinity of the site.

Object(s) (O) - Anything that is visible or tangible and is stable in form.

Open Storage (OS) - An area of open-air (outdoor) storage of containerized, raw or waste materials, within industrial or manufacturing sites.

Railcar (RC) - A railroad car.

Site - The land or water area where any facility or activity is physically located or conducted, including land used in connection with the facility or activity.

Stain(ing) (ST) - A residue or discoloration resulting from a spill, discharge, or removed/dispersed materials.

Tanks - Vertical tanks (VT), horizontal tanks (HT), pressure tanks (PT), tank farms, and solid waste management units. A large receptacle, container, or structure for holding liquid or gas.

Trailer (TRL) - A large van or wagon drawn by an automobile, truck, or tractor, used especially in hauling freight by road.

REFERENCES

MAPS

Source ¹	Figure	Name	Scale	Date
USGS	1	State of Michigan	1:2,500,000	1972
USGS	2	Dearborn, Michigan	1:24,000	1983

COLLATERAL INFORMATION

EPA. 2002. Statement of Work for N-Forcer Site, Dearborn, Michigan, with collateral data supplied by EPA Region 5 as attached to EPIC Remote Sensing Services Request Form 1/09/2003, 8pp.

LMS (Lockheed Martin Services). 2003. Master Quality Assurance Project Plan. Prepared for EPA Environmental Sciences Division. Contract 68-D-00-267. Las Vegas, Nevada.

USGS. 1976. A Land Use and Land Cover Classification System for Use with Remote Sensor Data. Geological Survey Professional Paper 964. United States Government Printing Office, Washington.

AERIAL PHOTOGRAPHS

Photo Source ¹	Figure [*]	Date of Acquisition	Original Scale	Film Type ²	Mission I.D.	Source Frame #	EPA EPIC Frame #
USGS	3,5	04/20/51	1:23,600	B&W	PN	64,65	81907,81908
NARA	-	04/27/52	1:25,000	B&W	ON003805	163,164	82008,82009
NARA	-	02/09/53	1:24,750	B&W	ON003344	204,205	82010,82011
FSA	6	05/16/57	1:20,000	B&W	XU	153,154	81966,81967
NARA	-	06/08/62	1:25,000	B&W	ON003308	88,89	82012,82013
USGS	7	11/21/66	1:24,000	B&W	VBOW	3/24,25	81909,81910
FSA	-	07/01/72	1:40,000	B&W	XU	1MM/177,178	81969,81970
USGS	8	10/15/73	1:24,000	B&W	VDJA	4/108,109	81912,81913
MDNR	9	07/17/78	1:24,000	CIR	MDNR29	102/15,16	82328,82329
SMCG	10	06/11/80	1:24,000	B&W	80-230	23/28,29	81905,81906
SMCG	11	05/08/85	1:24,000	B&W	85-242	23/35,36	81903,81904
MDNR	-	06/29/88	1:24,000	B&W	MDNR437	382/137,138	82326,82327
SMCG	12	04/18/90	1:24,000	B&W	90-183	23/32,33	81901,81902
SMCG	4	03/26/00	1:24,000	B&W	99-629	25/58,60	82324,82325

¹FSA Farm Services Agency, U.S. Department of Agriculture
MDNR Michigan Department of Natural Resources, Lansing, Michigan
NARA National Archives and Records Administration, College Park, Maryland
SMCG Southeast Michigan Council of Governments, Detroit, Michigan
USGS U.S. Geological Survey, U.S. Department of the Interior
² B&W Black-and-White
CIR Color Infrared
* Photographs listed with no figure number were analyzed but not placed in this report.

LEGEND	
B	- BUILDING
BA	- BUILDING ADDITION
C	- CONTAINER(S)
CON	- CONVEYOR
CR	- CRATE(S)
CYL	- CYLINDRICAL
DG	- DISTURBED GROUND
DU	- DUMPSTER
HT	- HORIZONTAL TANK
LT	- LIGHT-TONED
M	- MATERIAL
MLT	- MULTI-TONED
MM	- MOUNDED MATERIAL
NB	- NEW BUILDING
O	- OBJECTS
OS	- OPEN STORAGE
POSS	- POSSIBLE
PROB	- PROBABLE
RC	- RAILCAR
ST	- STAIN(ING)
TRL	- TRAILER
VT	- VERTICAL TANK
-----	ACCESS ROAD
→	DRAINAGE
————	FEATURE BOUNDARY
+——+	RAIL SPUR
————	SITE/STUDY AREA BOUNDARY